THE CLAIMS

The pending claims are presently as follows.

1. (Previously presented) A system for sending low rate data on a packet basis in an 8-VSB standard data packet stream, said system comprising:

an 8-VSB signal transmitter capable of transmitting a low rate data packet that comprises data bytes, each of one or more of the data bytes containing both information bearing bits and non-information bearing bits.

2. (Previously presented) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 1 wherein said 8-VSB signal transmitter is capable of determining values of said non-information bearing bits in said low rate data packet so that said non-information bearing bits will be correctly encoded.

3. (Original) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 1 wherein said low rate data packet comprises data bytes in which half of the bits in each data byte contain information and half of the bits in each data byte do not contain information.

4. (Previously presented) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 3 wherein said 8-VSB signal transmitter is capable of determining values of said bits that do not contain information so that said bits that do not contain information will be correctly encoded.

5. (Original) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 3 wherein said low rate data packet comprises eight (8) bit data bytes in which bit 6, bit 4, bit 2, and bit 0 in each data byte contain information and in which bit 7, bit 5, bit 3, and bit 1 in each data byte do not contain information.

6. (Previously presented) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 5 wherein said 8-VSB signal transmitter is capable of determining values of bit 7, bit 5, bit 3, and bit 1 so that they will be correctly encoded.

7. (Previously presented) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 6 wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 so that each output symbol is from one of the four levels -7, -3, + 3, and +7 by setting a value of a Z_2 bit from a trellis encoder of said 8-VSB signal transmitter equal to a value of a Z_0 bit from said trellis encoder.

8. (Previously presented) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 7 wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 by calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator $\oplus$ signifies a logical exclusive OR operation.

9. (Previously presented) A system for sending half rate data on a packet basis in an 8-VSB standard data packet stream in an 8-VSB signal transmitter comprising a Reed Solomon encoder, a data interleaver, and a trellis encoder, wherein said system comprises:

a first data packet switch before said Reed Solomon encoder capable of determining whether a data packet is a full rate data packet or a half rate data packet, said first data packet switch capable of sending a full rate data packet to said Reed Solomon encoder and capable of sending a half rate data packet to said data interleaver; and

a second data packet switch after said trellis encoder capable of determining whether a data packet is a full rate data packet or a half rate data packet, said second data packet switch capable of sending a full rate data packet to a multiplexer and capable of sending a half rate data packet to an exclusive OR unit.

10. (Previously presented) The system for sending half rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 9 wherein said exclusive OR unit is capable of determining values of bits in a half rate data packet that do not contain information so that said bits that do not contain information will be correctly encoded.

11. (Previously presented) The system for sending half rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 10 wherein said half rate data packet comprises eight (8) bit data bytes in which bit 6, bit 4, bit 2, and bit 0 in each data byte contain information and in which bit 7, bit 5, bit 3, and bit 1 in each data byte do not contain information; and

wherein said exclusive OR unit is capable of determining the values of bit 7, bit 5, bit 3, and bit 1 so that each output symbol is from one of the four levels -7, -3, + 3, and +7 by setting a value of a Z_2 bit from said trellis encoder equal to a value of a Z_0 bit from said trellis encoder.

12. (Previously presented) The system for sending half rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 11 wherein said exclusive OR unit is capable of determining the values of bit 7, bit 5, bit 3, and bit 1 by calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said

trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator ⊕ signifies a logical exclusive OR operation.

13. (Original) The system for sending half rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 12 wherein an output of said exclusive OR unit is coupled to an input of said Reed Solomon encoder; and wherein said exclusive OR unit is capable of sending a half rate data packet to said Reed Solomon encoder in which the values of bit 7, bit 5, bit 3, and bit 1 in each data byte of said half rate data packet have been determined so that all eight (8) bits in each data byte of said half rate data packet will be correctly encoded.

14. (Previously presented) The system for sending half rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 13 further comprising:

a permutation unit located after said Reed Solomon encoder and before said data interleaver, said permutation unit capable of determining whether a data packet is a full rate data packet or a half rate data packet, said permutation unit capable of sending a full rate data packet to said data interleaver without performing a permutation, said permutation unit capable of permuting the bytes in a half rate data packet to ensure that parity byte positions do not occur before data byte positions in each data packet.

15. (Previously presented) The system for sending half rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 14 wherein said permutation unit is capable of setting a rate bit in a field sync segment of said half rate data packet to change a status of said half rate data packet from half rate status to full rate status.

16. (Original) The system for sending half rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 15 further comprising an 8-VSB signal receiver comprising:

a reverse permutation unit located between a data de-interleaver and a Reed Solomon decoder, said reverse permutation unit capable of reversing the permutation of bytes carried out by said permutation unit of said 8-VSB signal transmitter.

17. (Previously presented) A method for sending low rate data on a packet basis in an 8-VSB standard data packet stream, said method comprising the steps of:

placing data in a low rate data packet that comprises data bytes, each of one or more of the data bytes containing both information bearing bits and non-information bearing bits;

determining values of said non-information bearing bits in said low rate data packet so that said non-information bearing bits will be correctly encoded; and

transmitting said low rate data packet with an 8-VSB signal transmitter.

18. (Original) The method for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 17 wherein said low rate data packet comprises data bytes in which half of the bits in each data byte contain information and half of the bits in each data byte do not contain information.

19. (Original) The method for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 17 wherein the step of placing data in a low rate data packet that comprises data bytes that contain both information bearing bits and non-information bearing bits comprises the steps of:

placing data in bit 6, bit 4, bit 2, and bit 0 in each eight (8) bit data byte so that bit 6, bit 4, bit 2, and bit 0 are information bearing bits; and

placing no data in bit 7, bit 5, bit 3, and bit 1 in each eight (8) bit data byte so that bit 7, bit 5, bit 3, and bit 1 are non-information bearing bits.

20. (Previously presented) The method for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 19 wherein the step of determining the values of said non-information bearing bits in said low rate data packet so that said non-information bearing bits will be correctly encoded comprises the step of:

setting a value of a Z_2 bit from a trellis encoder of said 8-VSB signal transmitter equal to a value of a Z_0 bit from said trellis encoder so that each output symbol is from one of four levels -7, -3, +3, and +7; and

calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator $\oplus$ signifies a logical exclusive OR operation.

21. (Previously presented) The method for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 20 further comprising the steps of:

permuting the bytes in said low rate data packet to ensure that parity byte positions of said low rate data packet do not occur before data byte positions in each low rate data packet; and

reverse permuting said permuted bytes in said low rate data packet after said low rate data packets are received in an 8-VSB signal receiver.

22. (Original) The method for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 19 further comprising the steps of:

sending said low rate data packet through a data interleaver;

sending said low rate data packet through a trellis encoder;

sending said low rate data packet through an exclusive OR unit;

sending said low rate data packet through a Reed Solomon encoder;

sending said low rate data packet through a permutation unit;

sending said low rate data packet through said data interleaver a second time; and

sending said low rate data packet through said trellis encoder a second time.

23. (Previously presented) A high definition television system comprising a system for sending low rate data on a packet basis in an 8-VSB standard data packet stream, said system comprising:

an 8-VSB signal transmitter capable of transmitting a low rate data packet that comprises data bytes, each of one or more of the data bytes containing both information bearing bits and non-information bearing bits.

24. (Previously presented) The high definition television system as claimed in Claim 23 wherein said 8-VSB signal transmitter is capable of determining values of said non-information bearing bits in said low rate data packet so that said non-information bearing bits will be correctly encoded.

25. (Original) The high definition television system as claimed in Claim 23 wherein said low rate data packet comprises eight (8) bit data bytes in which bit 6, bit 4, bit 2, and bit 0 in each data byte contain information and in which bit 7, bit 5, bit 3, and bit 1 in each data byte do not contain information; and wherein said 8-VSB signal transmitter is capable of

determining the values of bit 7, bit 5, bit 3, and bit 1 so that they will be correctly encoded.

26. (Previously presented) The high definition television system as claimed in Claim 25 wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 so that each output symbol is from one of the four levels -7, -3, + 3, and +7 by setting a value of a Z_2 bit from a trellis encoder of said 8-VSB signal transmitter equal to a value of a Z_0 bit from said trellis encoder.

27. (Previously presented) The high definition television system as claimed in Claim 26 wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 by calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator $\oplus$ signifies a logical exclusive OR operation.

28. (Previously presented) The high definition television system as claimed in Claim 27 further comprising:

a permutation unit located after a Reed Solomon encoder and before a data interleaver in said 8-VSB signal transmitter, said permutation unit capable of permuting the bytes in a half rate

data packet to ensure that parity byte positions do not occur before data byte positions in each data packet.

29. (Original) The high definition television system as claimed in Claim 28 further comprising:

an 8-VSB signal receiver comprising a reverse permutation unit located between a data de-interleaver and a Reed Solomon decoder of said 8-VSB signal receiver, said reverse permutation unit capable of reversing the permutation of bytes carried out by said permutation unit of said 8-VSB signal transmitter.